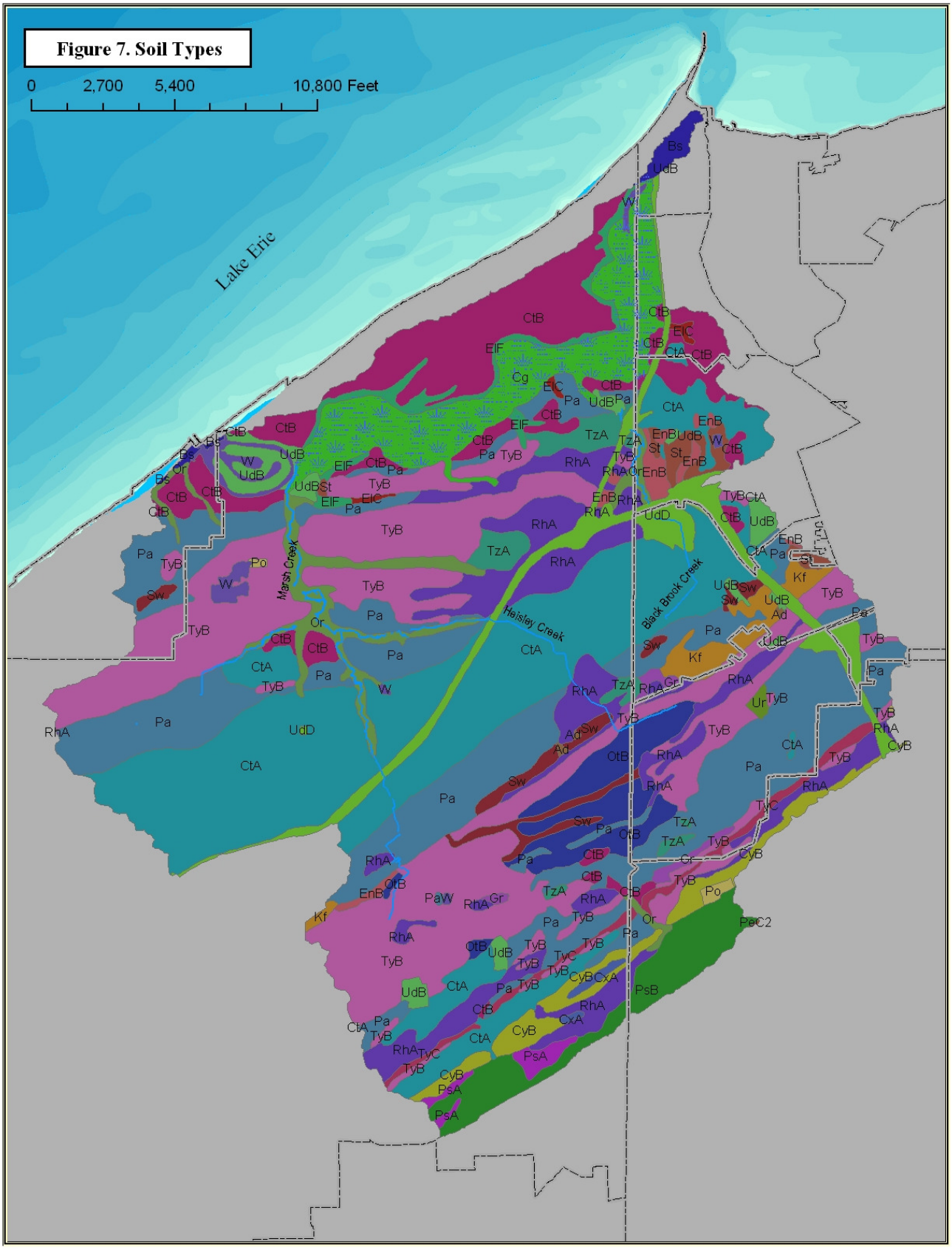
Figure 7. Soil Types
0
2,700
5,400
10,800 Feet
Lake Erie
Marsh Creek
Heisley Creek
Black Brook Creek

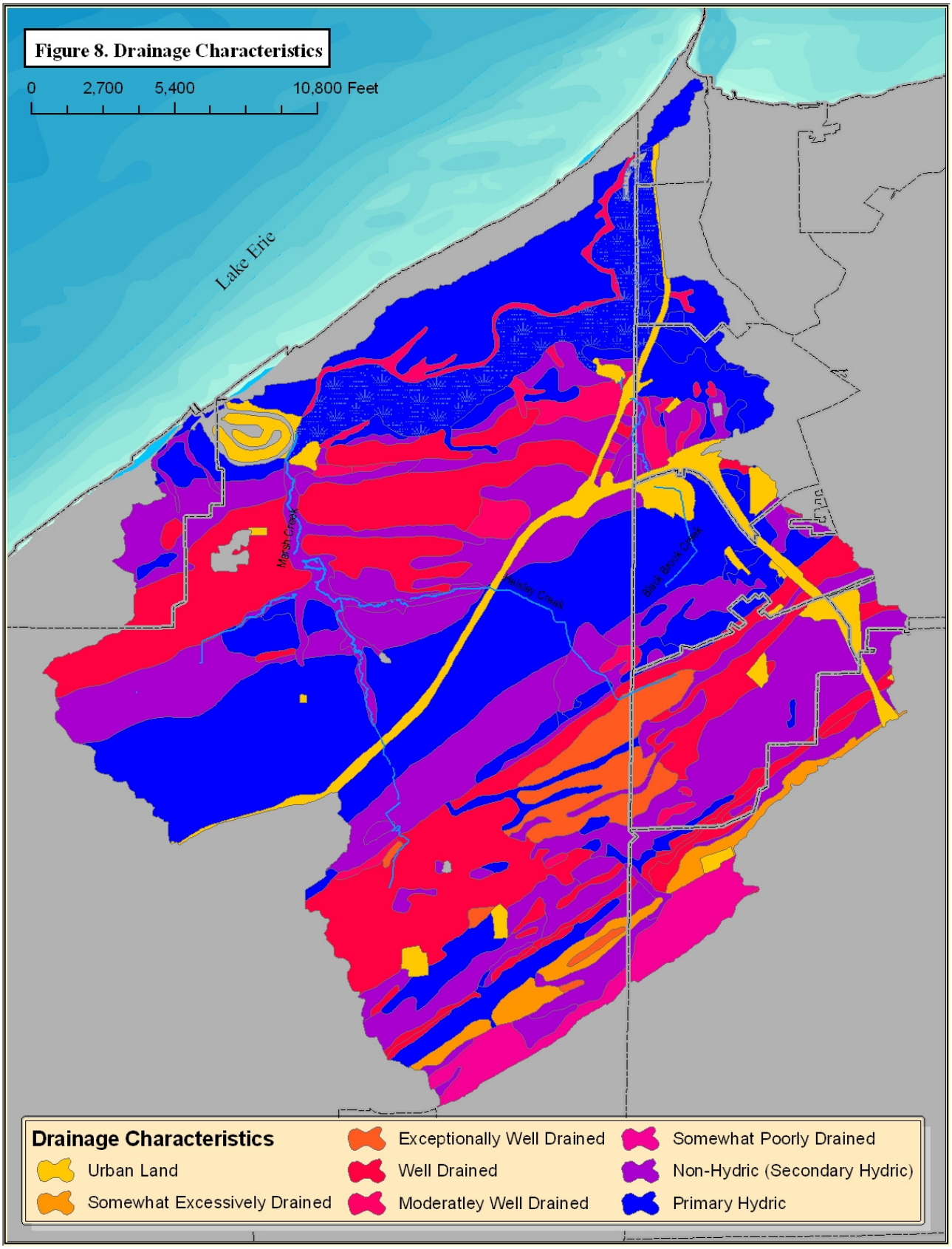
Figure 8. Drainage Characteristics
0
2,700
5,400
10,800 Feet
Lake Erie
Marsh Creek
Turkey Creek
Black Brook Creek
Drainage Characteristics
Urban Land
Somewhat Excessively Drained
Exceptionally Well Drained
Well Drained
Moderatley Well Drained
Somewhat Poorly Drained
Non-Hydric (Secondary Hydric)
Primary Hydric

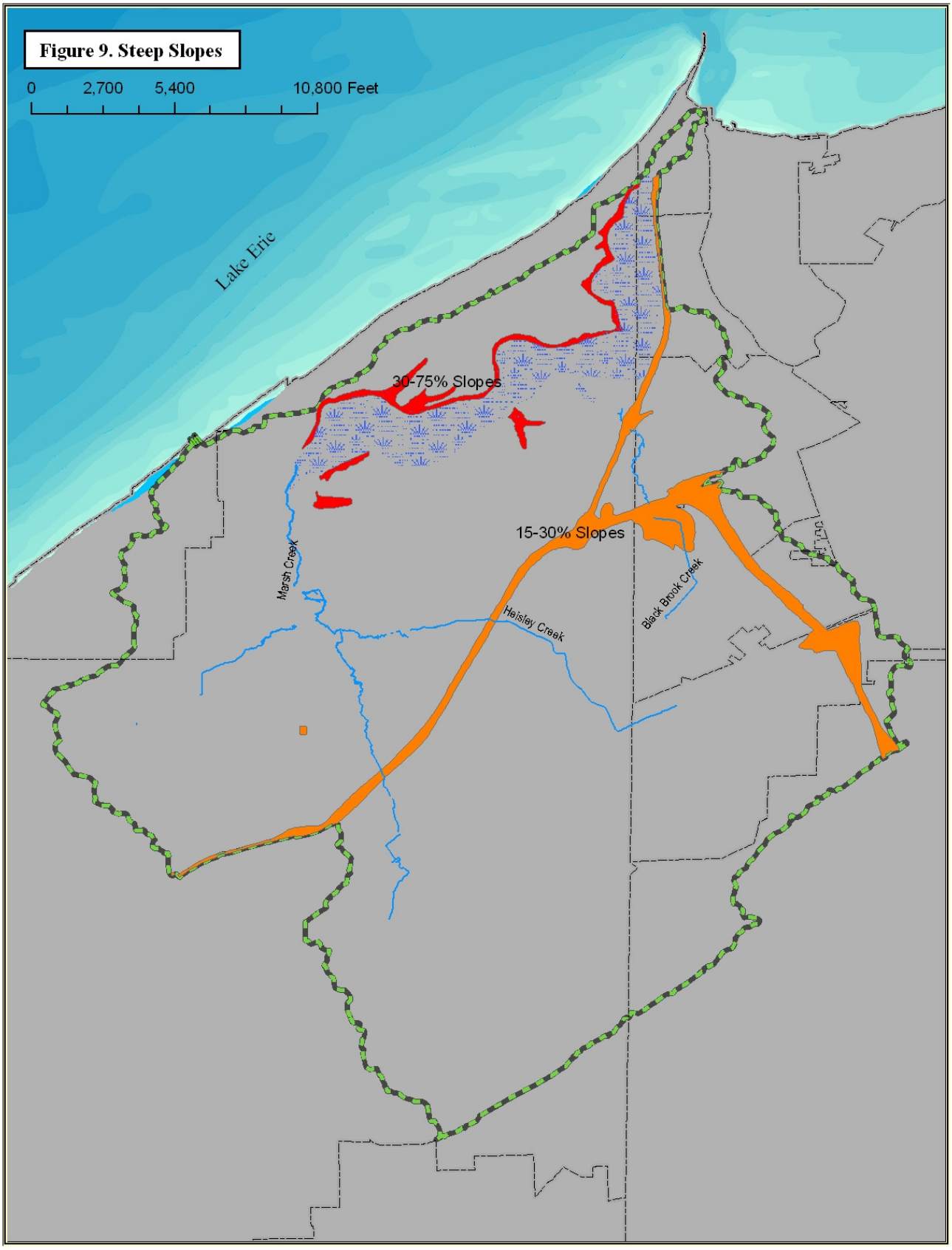
Figure 9. Steep Slopes
0
2,700
5,400
10,800 Feet
Lake Erie
30-75% Slopes
15-30% Slopes
Marsh Creek
Heisley Creek
Black Brook Creek

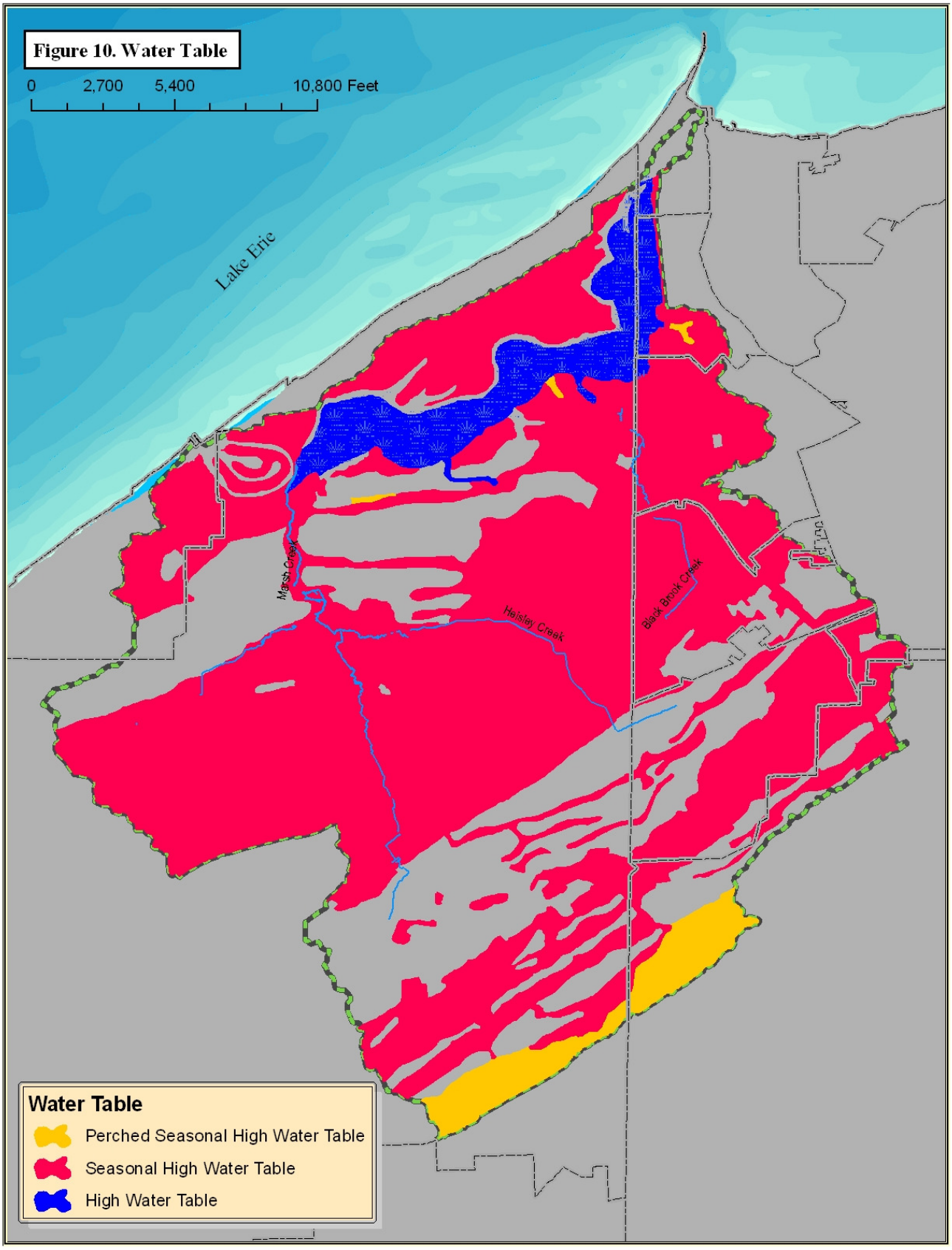
Figure 10. Water Table
0
2,700
5,400
10,800 Feet
Lake Erie
March Creek
Haisley Creek
Black Brook Creek
Water Table
Perched Seasonal High Water Table
Seasonal High Water Table
High Water Table

Biological Features

Rare, Threatened, and Endangered Species Currently documented within the Mentor Marsh Watershed by the Cleveland Museum of Natural History:

- American Bittern, Endangered within Ohio
- Least Bittern, Threatened within Ohio
- Sora Rail, Species of Special Concern in Ohio
- Spotted Turtle, Species of Special Concern in Ohio
- Winged sedge (Carex alata), Potentially Threatened within Ohio
- Robust smartweed (Polygonum robustius), Potentially Threatened within Ohio
- Native reed-grass (Phragmites australis subspecies americanus), recently approved as an addition to Ohio Rare Plant List with the A (added) status.

List of invasive species at Mentor Marsh in order of their threat :

Invasive Plants within wetlands:

- Reed grass (Phragmites australis subspecies austrailis)
- Narrow-leaf cattail (Typha angustifolia)
- Hybrid cattail (Typha latifolia)
- Glossy buckthorn (Rhamnus frangula)
- Common buckthorn (Rhamnus cathartica)
- Reed canary grass (Phalaris arundinacea)
- Purple loosestrife (Lythrum salicaria)
- Black alder (Alnus glutinosa)
- Japanese Knotweed (Polygonum cuspidatum)

Invasive Plants on uplands:

- Garlic mustard (Alliaria petiolata)
- Japanese honeysuckle (Lonicera japonica)
- Glossy buckthorn (Rhamnus frangula)
- Common buckthorn (Rhamnus cathartica)
- Autumn olive (Elaeagnus umbellate)
- Morrows bush honeysuckle (Lonicera morrowi)
- Tatarian honeysuckle (Lonicera tatarica)
- Myrtle (Vinca minor)
- Norway maple (Acer platanoides)
- Canary grass (Phalaris arundinacea)
- Fortunes spindle-tree (Euonymus fortunii)
- Privet (Ligustrum sinense)

Water Resources

11 Digit and 14 Digit HUC Watersheds

Region 04 Great Lakes Region -- The drainage within the United States that ultimately discharges into: (a) the Great Lakes system, including the lake surfaces, bays, and islands; and (b) the St. Lawrence River to the Riviere Richelieu drainage boundary. Includes parts of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin.

Subregion 0411 -- Southern Lake Erie: The drainage into Lake Erie from the Vermilion River Basin boundary to and including the Ashtabula River Basin. Ohio, Pennsylvania. Area = 3030 sq.mi.

Accounting Unit 041100 -- Southern Lake Erie. Ohio, Pennsylvania. Area = 3030 sq.mi.

Cataloging Unit 04110003 -- Ashtabula-Chagrin. Ohio, Pennsylvania. Area = 630 sq.mi.

04110003-010-Lake Erie tributaries (below Cuyahoga R. to above Grand River [except Chagrin R.]) Area = 76,155-acres

04110003-010-040-Lake Erie drainage east of Chagrin R. and west of Grand R. (includes Mentor Marsh) Subarea= 18,321-acres

Climate and Precipitation

The climate and precipitation of the watershed has been studied extensively and is very well summarized in the Fineran dissertation "Assessing Spatial and Temporal Vegetative Dynamics at Mentor Marsh, 1796 to 2000 A.D." Section 3.4.1.1

> "The corrected annual precipitation data for the years between 1810 and 1838 suggest that this was a period of above average annual rainfall, which corresponds to the rising Lake Erie water levels during this time period."
>
> "The overall trend is rising Lake Erie water levels especially during the 1830's, with many years of above average annual rainfall indicating wetter climatic conditions during this first time interval."
>
> "Lake Erie water levels between 1876 and 1959 were generally much below average with an especially low period during the drought years of the 1930's followed by several high water years in the 1940's and 1950's."
>
> "Annual precipitation for Lake Erie, as provided by Powers et al (1960) for the years 1810 to 1959, also shows a decrease for many years during the second time interval."
>
> "Beginning in 1890's until the late 1940's annual precipitation is much less than it was for most of the first time interval, 1796 to 1876. Beginning in 1887, the 5-year running average for annual precipitation stays below average until 1949."
>
> "Annual precipitation for Lake Erie is … very low in the late 1800's and then generally around average in the early 1900's. This is followed by a period of below-average annual precipitation in the 1930's indicating the drought years that occurred during that decade. The 1930's drought is followed by a general increase in annual precipitation beginning in the 1940's and lasting for much of the 1950's."

"Annual precipitation for the upper Great Lakes basin was also generally below average beginning around 1892 and lasting until the 1940's."

"The overall trend for the second time interval, 1876 to 1959, is lower Lake Erie water levels and many years of drought during the late 1800's and during the 1930's but with several years of above average precipitation as well. …. These conditions indicate a drier climate during the second time interval,…"

"Lake Erie precipitation also shows an increase in annual precipitation during the third time interval, 1959 to 1976."

"Annual precipitation for the upper Great Lakes basin was above-average beginning around 1968 and continued above average through the end of second time interval in 1976."

"From the historical records for Lake Erie water levels and annual precipitation we see that there was a change to a wetter climate during the third time interval, 1959 to 1976,…"

"Annual rainfall between 1976 and 2000 was also above average with only a few years below long-term average."

"So, the overall trend for the time period 1976 to 2000 is above average lake levels and above average annual rainfall." (Fineran, 2003)

Streams, Subwatersheds, and Floodplains

The Mentor Marsh Watershed drains 22.6 square miles, or 14463-acres. The watershed is divided into 3 sub-watersheds. The smallest is the Black Brook Creek watershed, which drains 2128.11-acres. Black Brook Creek drains from northwest Concord Township into Painesville Township and then into Painesville City before entering the City of Mentor near it's confluence with the Mentor Marsh. The confluence is on the eastern end of the marsh near State Route 44 and Deer Ridge Road. No 100-year floodplain has been officially mapped in this subwatershed. The largest subwatershed is Marsh Creek, which drains 8859.26-acres. Marsh Creek also starts in northwest Concord Township and then drains into the City of Mentor and confluences with the marsh near Mentor Lagoons. An extensive 100-year floodplain exists along Marsh Creek, extending as far south as Jackson Street. Floodplains mapped by FEMA are also located along a large unnamed tributary to Marsh Creek that flows along Hilltop Drive and extends into the headwaters along the active CSX railroad north of Jackson Street.

Marsh Creek has two large tributaries, Heisley Creek and Martin Ohm Creek. The Heisley Creek Watershed is 1766.9-acres and starts in northwest Concord Township. It then flows into Painesville Township before entering the City of Mentor where it enters Marsh Creek near Harvest Home Drive and Walden Court. Heisley Creek also contains extensive FEMA floodplains from it's confluence with Marsh Creek to the Painesville Township line. The floodplain becomes very wide south of the CSX railroad. Most likely due to inadequate culvert capacity backing up floodwaters along drainage ditches parallel to the railroad.

The Martin Ohm Creek Watershed is 1459.25-acres and aside from a small portion of the watershed located in southeast Mentor-on-the-Lake; the entire watershed is located in the City of Mentor. Martin Ohm Creek is the only surface water tributary to the marsh in the western limits of the watershed, no FEMA floodplains were identified along the creek.

The last of the subwatersheds is the Mentor Marsh Watershed, which drains 3473.70-acres (excluding the Marsh Creek and Black Brook Creek tributaries). This watershed is typified by overland flow and stormwater inputs from culverts and highly modified surface water channels. The watershed drains eastern Mentor-on-the-Lake, the northern portion of the City of Mentor

(included Mentor Headlands), and portions of Grand River, Painesville City, and Painesville Township. The landscape changes which started to occur in the late 1800's and continue today have resulted in a highly modified system of surface water drainage. Most of the functions of headwater stream systems in the watershed have been lost. A comparison of USGS topographic maps and USGS soil survey maps with current GIS hydrology layers show no wholesale system of culverts in the watershed. The exceptions are small sections of culverts for road crossings and a section of Blackbrook Creek near it's confluence with the marsh.
The streams and surface water network are depicted in Figure 11. The subwatersheds are mapped in Figure 12. Figure 13 shows the extent of the 100-year floodplains.

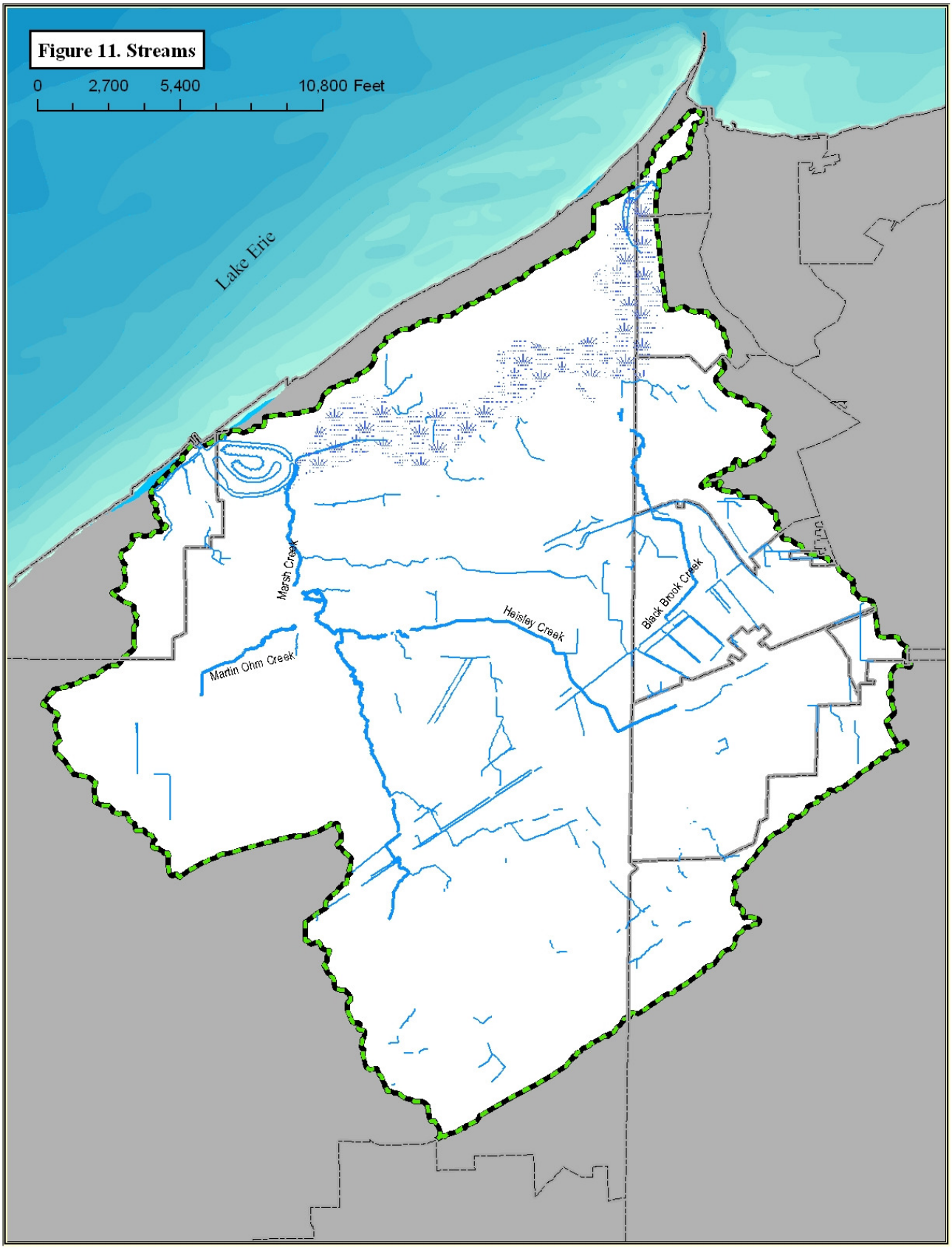
Figure 11. Streams
0
2,700
5,400
10,800 Feet
Lake Erie
Marsh Creek
Martin Ohm Creek
Heisley Creek
Black Brook Creek

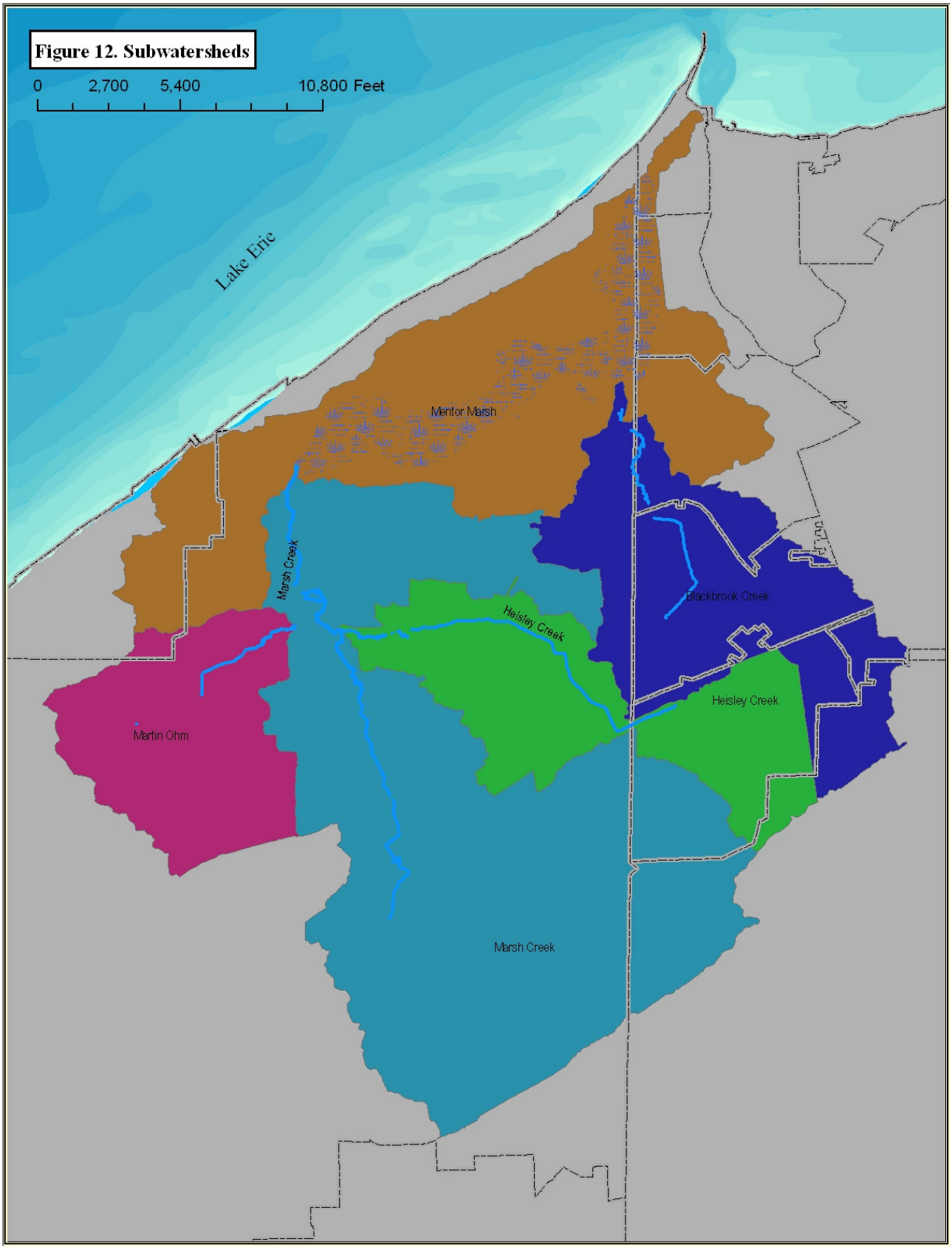
Figure 12. Subwatersheds
0
2,700
5,400
10,800 Feet
Lake Erie
Mentor Marsh
Marsh Creek
Heisley Creek
Blackbrook Creek
Heisley Creek
Martin Ohm
Marsh Creek

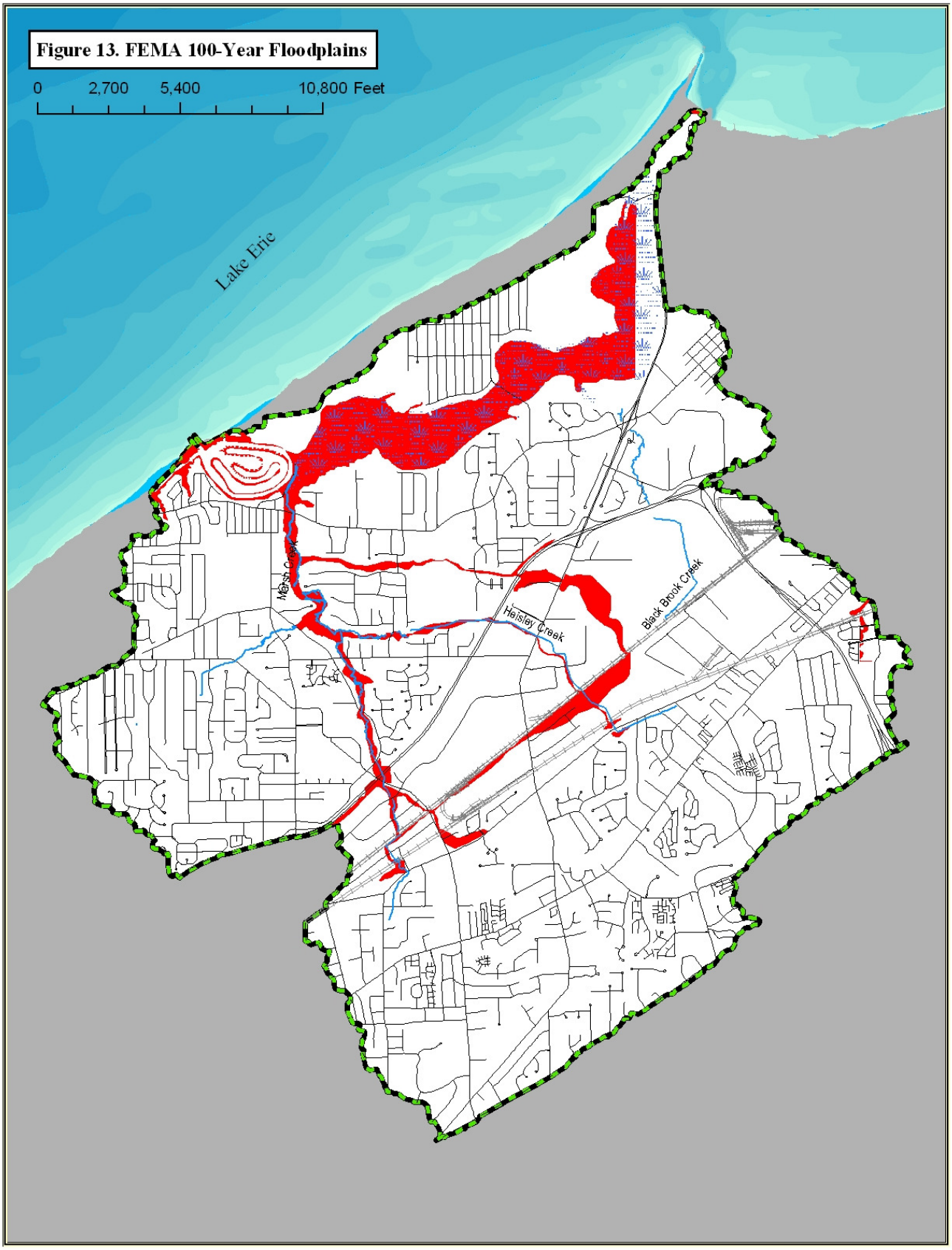
Figure 13. FEMA 100-Year Floodplains
0
2,700
5,400
10,800 Feet
Lake Erie
Marsh Creek
Heisley Creek
Black Brook Creek